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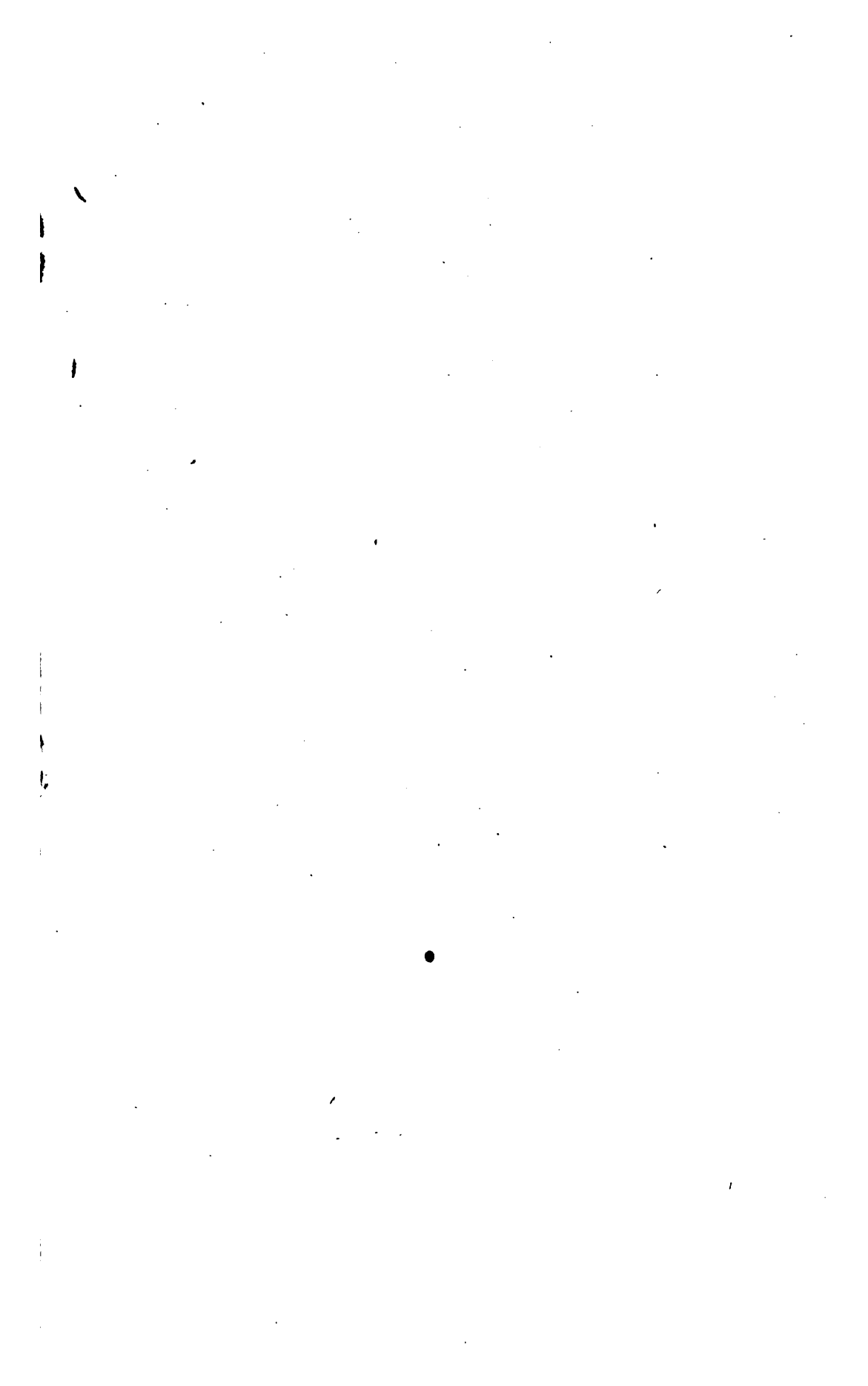
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FROM

Secretary of State
Rhode Island



Rhode Island Committee on Education

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State of Rhode Island and Providence Plantations.

THE INDUSTRIAL ARTS IN THE PUBLIC SCHOOLS.

REPORT

OF THE

Committee on Education,

MADE TO THE HOUSE OF REPRESENTATIVES, AT ITS
JANUARY SESSION, 1877.



PROVIDENCE:

ANGELL, BURLINGAME & CO., PRINTERS TO THE STATE.

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Secretary of State,
Washington.

REPORT.

To the Honorable the House of Representatives, at the January Session, 1877:—

At the January session of 1876, the following resolution was adopted by the House of Representatives:—

“RESOLVED, That the Committee on Education be and hereby is instructed to inquire and report to this House, whether or not the public money now expended on schools above the grade of Grammar schools, could not be expended more to the public advantage in instructing the pupils attending the public schools in the Industrial Arts.”

The state of Rhode Island appropriates annually to public education, in addition to the Government Land Grant fund given some years ago to Brown University, the income of which is made available in the education of from thirty to forty students, the sum of ninety thousand dollars. Of the money thus appropriated, \$63,000 is distributed to the towns according to the number of children under fifteen years of age; and \$27,000 in proportion to the number of school districts in each.

As children ordinarily do not complete the Grammar school course, until they are over fourteen, it can hardly be assumed that any “public money” is expended upon

schools above that grade, if we interpret the expression "public money" to mean the amount mentioned as such in the statute relating to its appropriation, and the only amount over whose disbursement this General Assembly has any direct control.

We are satisfied, however, that such a strict construction of the resolution was not intended, and that the subject referred to us, embraced expenditures for, and instruction in all the public schools, whether under state or municipal patronage. This view of the general scope of the resolution offers us four special topics for consideration, which, taken in their order, appear to be,

- 1st. The proper limit of free education.
- 2d. The importance of the High School in the system.
- 3d. The variety and kind of instruction in the schools.
- 4th. Industrial Art education.

THE PROPER LIMIT OF FREE EDUCATION.

The fundamental principle underlying our public school system is, that the safety of the state depends upon the education of all its people; and although this principle is universally recognized, there exist differences of opinion as to the precise amount of education the state should furnish.

There are those who maintain that when a child is fourteen or fifteen years of age, and has mastered the rudiments of an English education, this modicum of knowledge will suffice to meet all the necessities of the case, and a boy without further scholastic advantages can enter upon some

mechanical pursuit, employment in commerce, or general business of life, and in due time fulfil all the requirements demanded by good citizenship. Others carry the idea still farther, in pronouncing more extended advantages of an educational nature a positive detriment to the body politic, because they have a tendency to diminish the number of good artisans, by fostering in the minds of the young an aversion to mechanical trades or manual labor in any form. They attribute the increase in the number of non-producers to a superabundance in the education of the masses, and aver that it is unwarranted in justice to tax property in order to afford greater opportunities for education than are now presented in the elementary schools.

These objections to an extension of the system beyond the Grammar schools are but a sample of the various opinions upon the subject, and they are perhaps among the most familiar to those who have carefully noted the history of public schools during the last few years. Emanating as these sentiments do, not merely from the ignorant and thoughtless, but also, in many instances, from those whose mental ability and liberal intellectual culture give weight to their opinions, and enable them to appreciate the advantages of a good education, we have given them careful and respectful consideration, but, nevertheless, feel constrained to withhold our concurrence.

A recent report of our State Commissioner of Schools shows that Reading, Spelling, Penmanship, Arithmetic, and Geography, are taught in all our schools of an intermediate and grammar grade. History of the United

States, and English Grammar, are taught in most of the grammar schools, and Vocal Music and Drawing in some of them. These branches are undoubtedly taught with varying degrees of thoroughness in the different schools, but allowing for an adequate instruction in all of them, we believe that such a curriculum embraces only the *minimum* which the state absolutely requires for its *safety*, and that more is essential to its *welfare* and *prosperity*.

Under our democratic institutions, the possibilities open to every child are far greater than under monarchical rule; the requirements, more exacting. We have no hereditary class, born to rule and hence educated for it from infancy, but, on the contrary, our future magistrates and legislators, national, state, and municipal, must come from the people generally, without regard to class distinctions. Already in our history, more than once, the chief position in our national government, has been filled by those who were born in the humblest sphere of life, and from Congress to Town Councils we have seen the various offices filled, not only by those who have previously enjoyed, but also by those who have been deprived of, good educational advantages.

The jury-box, too, that important feature in our institutions, draws its complement from no class, but from the whole people, and the welfare of all is dependent upon the degree of intelligence possessed by those placed in that responsible position. Ignorance in the voters is dangerous to the state, and a lack of suitable educational preparation in those who are to perform the multifarious duties attend-

ant upon the workings of democratic institutions in all their ramifications, is highly detrimental, to say the least.

Our state is largely dependent for its prosperity upon its manufacturing and mechanical industries, and these require a cultivated intelligence in order to keep pace with similar works in other states and countries in making constant progress in skill and improvements, in methods and machinery. With all these great interests in view, we cannot safely trust to the chance that natural ability will develop itself, or that those who could be really benefited by a higher education, will, in some way, manage to secure it. The example of other countries teaches us that supremacy can only be secured and maintained by advancing the general education of the masses.

The statement, that any advance beyond the rudiments of an English education tends to unfit its recipients for the practical duties of life, does not seem justifiable, unless it be granted that such advance is made under the tuition and supervision of persons deficient in the qualifications for the exalted position of teacher.

True education looks to the fostering and perfecting of all that is ennobling in character ; cultivates correct thinking and reasoning powers ; enlarges the mind to a better realization of the duties and responsibilities of every-day life ; helps to perceive the dignity of labor in every form, whether mental or manual, and prevents from narrow-minded or one-sided views of social questions. There may be a shallow imitation, giving a superficial knowledge of a few facts, dates or figures, which might engender self-conceit,

and puff up the mind of the scholar to such a degree as to cause him to depreciate honest labor, but if such a sham is disseminated in any of our schools, the sooner it is exposed and eradicated, the better for the community. An ideal education has not yet been obtained, and ideal educators are not yet found in every school, but to do them justice, our teachers, as a class, are striving earnestly to implant in the minds of their scholars correct views as to the proper conduct of life.

It cannot be denied, however, that false notions of life in all its details, do exist prevalently, permeating all classes of society, producing social drones, conducing to extravagance and caste in an odious form, setting at defiance all true principles of democracy, and tending to subvert the best elements not only of social life, but almost, it may be said, of true Christianity. While we deplore the existence of social influences so baleful in their nature, so repugnant to the spirit of our institutions, and as palpably absurd as they are widely diffused, it is not our province, even if it were in our power, to do more than give them a passing recognition as facts or problems requiring solution at the hands of experts in philosophy, religion and sociology.

We are compelled, however, as the result of our observation, to deny the propriety of ascribing them to our public school system, and venture the assertion that the closest analysis cannot locate their origin inside of our school doors, and connect it inherently with our school training.

We learn from reliable statistics, that not more than three per cent. of the pupils in our public schools ever enter a

High School, and probably less than two per cent. complete the course ; hence, admitting all the alleged evil effects of a surplus of education, it can, in no case, contaminate more than a very small proportion of the rising generation. We hope the time is not far distant when all of the children in our state may be thoroughly instructed in the branches now taught in the Grammar schools, but we cannot agree with these objectors in fixing upon that as the limit of free public education.

What may be the exact place, if any, in our system of public education, where it should cease to be entirely free of expense to the scholar ; whether admission in all cases to the higher grades, should be made dependent upon the degree of capacity and merit shown in the lower ones, upon the development of adaptability for further advantages, or upon competitive examinations for free scholarships, and other suggestions that are frequently made upon this subject, are not strictly within the scope of this report, and have not received consideration in this connection.

IMPORTANCE OF THE HIGH SCHOOL IN THE SYSTEM.

Higher education is the fountain of popular education, and we see that in all countries where great success has attended the efforts to instruct the masses, it has been due to the influences emanating from the higher seminaries of learning. Whatever influences operate detrimentally to the High schools, in the same degree, militate against the real efficiency of the elementary schools. The prospect of advancement to the upper grade, serves as a valuable

stimulus to the mind of the scholar just laboring to grasp the rudiments, and the high school furnishes a goal for the laudable ambition of many a child, who, without it would be listless in his efforts and indifferent as to their results. The facilities afforded to any child possessed of superior mental ability, however poor, to attain the highest round of the ladder of education, render our system of public education truly substantial and democratic.

It is undoubtedly true that some who have received the advantages of the higher training, fail to develop in their subsequent career, proportionately beneficial results, but it is equally true, that many others who contribute largely to all that makes up the prosperity of the State, would have been unable to do so, but for the opportunities afforded them by the High school.

Aside from its relation to the lower grades as a goal of ambition to be eagerly sought for, it occupies an intermediate position in furnishing suitable preparation to those boys for whom the State has provided free scholarships in Brown University.

From an economical and practical point of view the High school is not an extravagant and useless appendage to the system, only to be criticised on account of its expense, for it serves admirably as a fountain, from which are drawn needed supplies of teachers for the elementary schools, which could be obtained in sufficient numbers from no other source. In this way the community is directly compensated for the increased expenditure for higher education. The Normal School is indispensable,

but unless enlarged far beyond any present anticipations, would prove inadequate to the full supply of teachers for all the schools of the State, for many years to come. At the present time, more than eighty-five per cent. of the teachers in the schools of Providence have come from the High school, and this ratio would undoubtedly be maintained in Newport, and other places in the State, where good High schools exist.

The question of the importance of High schools and the necessity for their existence has received such thorough agitation and discussion during the period when they were first established in our State, that we deem it supererogatory to give it at this time, more than a merely general consideration and leave it with the expression of our conviction, that it is *inexpedient*, in view of the interests of the public, that High schools should be dispensed with as a part of our system of public instruction. They may be *modified, altered or improved* as the exigencies of the various localities require, but *never abolished*.

THE VARIETY AND KIND OF INSTRUCTION IN THE SCHOOLS.

The branches now taught in the elementary schools, all seem well adapted to the purpose, and none in our judgment could well be omitted. If more can be included, so much the better.

The great desideratum, however, is that they should be *taught thoroughly*, so that scholars who have finished their course, shall really *know* what they have spent so much time in learning. The urgent need of this is instanced in an item

in a recent report of the Board of Visitors at West Point, which states, that during the preceding five years, thirty-five per cent. of the applicants for admission to the military academy, from Rhode Island, as well as from other New England States where there are good educational facilities, had failed to pass the preliminary examination in these elementary branches.

There has been in the past, undoubtedly, a tendency in many schools to follow blindly the topics as arranged in the text books, leading to unnecessary minuteness of detail in Geography and Grammar, but we believe it is now the practice with all judicious committees and teachers to consult common sense in making omissions which save much time and incur no loss to the scholar. As time advances, the qualifications of teachers will attain a higher standard, and the quality of their instruction become correspondingly improved ; meanwhile the friends of good education will continue to insist upon *accuracy*.

Criticisms upon the curriculum of the High Schools are very common, and differences of opinion are to be expected, when we consider the varying aims of the pupils who enter them. Some propose to take a College course, others commercial pursuits, others, girls, of course, hope to become teachers, while still others anticipate only a year or two in the High School and then some business or mechanical pursuit. Under such circumstances it would seem evident that whatever may be the regular course of study prescribed, it should not be inelastic, but on the contrary, should offer to the necessities of each scholar that which is best

adapted to them, and include optional branches. We know of some High Schools in this State, where great latitude in this respect is allowed, and arrangements are made with marked success, to meet the exigencies of all classes of pupils; this should be the case in all of them. Undoubtedly, in every place, those who direct the schools, are influenced not only by their own belief as to what is best for them but also by the opinions of the community in which they live. This has led to changes and modifications from time to time, reflecting the average controlling sentiment of each community, and will continue to do so in future. The conditions of the problem of public education are constantly changing. Continued immigration has in this state added an important element to its difficulties. The people have changed in modes of thought, habits of life and methods in business; the variety of employments has increased and mechanical arts have made such progress, that the schools and methods of culture which served the purpose formerly, would not answer the requirements of the present time. Once the public school house and the meeting-house were built near together, and education and religion went hand in hand; the schoolmaster and the parson labored, if not always together, at least in the same sphere of duty and were bound by a common sympathy. Now, however, education is remanded to the teacher in the public school, while religion is banished from the school, and relegated to the home, the church and the Sabbath School. Again, in the earlier history of public schools, manual labor was far more common than now, from necessity, and hard work de-

veloped the physical energies of the people to such a degree, that the need of greater intellectual culture was seen and led to earnest efforts in that direction. Hence the schools have endeavored to carry out the idea, by giving greatest attention to the cultivation of the brain, educators believing that even strictly disciplinary studies were important as a part of the preparation for the practical duties of life. Now, however, we find quite prevalent among the people, indications of desire for some modification of the system of instruction, that shall look to a more direct and specific training for such of the scholars as may become artisans, or rather, such a training as may tend to induce them to become artisans.

These are but instances of many changed conditions in school matters, which have called for the exercise of the most careful discretion by the managers of the schools, who have probably given in each locality, such a curriculum for the High school, as in their judgment the true interests of the whole people required. That, in any case, perfection has been attained in the course of study designated, in the methods of teaching, or in any of the details of the system no sensible person will claim, while all friends of public education will unite in demanding that the schools shall advance harmoniously with the spirit of the age.

INDUSTRIAL ART EDUCATION.

Recognizing the fact that our public school system is not perfected beyond criticism or improvement, and that it is progressive in its nature, as well as elastic in its adap-

tation to the wants of the people, we must take cognizance of the sentiment quite prevalent in the community, that the results are not fully commensurate with the expenditure of money, and that the element of "practicality" is not as large a factor as it should be, in the great educational problem of the period. The importance of this opinion is acknowledged by the warmest friends of public education, and the popular demand has become so urgent, that at last, it has found expression in that part of the resolution before us, requiring a consideration of the question of industrial art education in the public schools.

The subject of industrial education is by no means new, and were it only the *general* subject, referred to us, the task would be easier than now, since we are confined to the specific consideration of its aspect as an integral part of our present established system, or at least a supplement of it. We find that we are not the only inquirers upon this subject, as our investigations have developed the fact that, in all parts of our country, the subject has recently risen to prominence, and school-boards, educators, and legislators, are seeking for information. The National Board of Trade of the United States has interested itself in this matter, and in January last, sent a memorial to this General Assembly, as to each of the legislatures of the other states, reading as follows :—

"Your memorialists, representing merchants and manufacturers of the United States, beg leave respectfully to represent unto your Honorable body, that the interference and dictation of Trades Union, and similar organizations with the system of apprenticeship, in earlier times

prevailing in this and other countries, the active competition of foreign manufacturers with American industries in both home and foreign markets, and the increased attention being given by governments abroad, to the development and improvement of skilled labor, by instruction in science and art, as applied to mechanics and manufacturing, renders it in the opinion of this Board of great importance to our material progress, that suitable provision be made for the establishment of Art and Science schools in each of the several states, where workmen and their children may receive such technical instruction as will improve and create skilled labor, to the end that the poorer classes of society may become better fitted for a higher development of industry, and our mechanical and manufacturing interests be enabled more successfully to compete with those of other countries ; therefore, your petitioners would respectfully pray that your Honorable body will adopt measures for the establishment of such a school, or schools, as is herein indicated, within the state of Rhode Island.

Respectfully submitted, by order of National Board of Trade,

FREDERICK FRALEY,

President."

JANUARY, 1877.

NEGLECT OF INDUSTRIAL EDUCATION, A NATION'S WEAKNESS.

The Universal Exhibiton in 1851 at London, bringing together, for the first time, so extensive a collection of the industrial products of all nations, enabled each one to obtain a correct view of its own condition, compared with that of others. The succeeding exhibitions in 1856, 1861, and 1867 furnished valuable lessons to all of the European countries, but especially to England, whose utter discomfiture at the Paris exhibition in 1867, led to systematic inquiries, as to the reasons for the more rapid progress made in other nations in many of those industries in which, every thing else being equal, the English ought to excel.

Government commissioners composed of representatives of the educated professions, applied sciences, engineering, education and manufacturers, were sent to the Paris exhibition, and a deputation of over fifty skilled artisans, also, whose reports all concurred in the statement, that the superiority of other nations in industrial products, was due entirely to the greater interest given to the industrial education of their people.

These statements, admitting inferiority on their own part, noting the rapid advancement of other countries since previous exhibitions, and attributing it solely to the one cause, were most startling, and thoroughly alarmed all Englishmen who had patriotic pride in maintaining for their country, precedence in manufacturing and mechanical industries.

They examined continental systems of industrial education, published elaborate reports, and, at once, adopted such educational measures as were deemed useful to them. During the last ten years, since the Paris exhibition, England has made wondrous efforts in this direction, and her advancement in the industrial arts was made manifest by the many exhibits of her productions at the Centennial Exhibition, last year. Meanwhile, other European countries, taught by experience, had also improved upon the industrial schools, which had given them the advantage of at least one generation of workmen, and were determined to continue in the lead.

The French manufacturers did not fail to note the extraordinary exertions England was making to contend for

precedence in industrial arts. They called the attention of the Government to the matter, and demanded increased educational advantages, in addition to those already in existence. A government commission, upon full investigation, learned that their system was very defective in comparison with that of Germany, and the result was, an energetic movement on the part of the state and of parties interested, which has, long ago, worked a great improvement in every branch of industry.

Switzerland, Germany, Austria, Russia and other countries were alike stimulated by the necessity of the case, to renewed interest in all that pertains to the advancement of the arts of industry, and their schools which had been good, were made better, while those which had been best of all, were advanced to a still higher standard. The process of improvement is still going on, and will continue to receive the utmost attention in each country that hopes to compete in the markets of the world, with the products of her industry.

However satisfactory may be the present development of Rhode Island mechanical and manufacturing industries; whatever there may have been of inventive genius, artistic skill or business enterprise to arouse feelings of pride in our achievements in the past, we must not lapse into a spirit of self-complacency, but rather take to ourselves the lesson from the experience of other countries, that no State can secure and maintain pre-eminence in mechanics and manufactures, except by the systematic and thorough training of the young in the industrial arts; that the palm of

superiority, by an unfailing law, will surely go to that country, where the *hand of the laborer is guided by a cultivated taste and a scientifically trained intellect.*

From the last census of this State we learn, that in every 1,000 of our population, 560 are engaged in manufacturing or mechanical industries, and this fact in itself is sufficient to give us an interest in the great question of industrial education, and should lead us to the adoption of any measures that furnish a prospect of success in solving this great problem.

It will be interesting to briefly note what has been done in European countries, where, as we have stated, the interest in this subject has become synonymous with their self-interest, and where the competition of different countries has compelled attention to it, under penalty of banishment from the best markets of the world.

INDUSTRIAL EDUCATION IN GERMANY.

The system of general education in Germany is well known as being most comprehensive, and as having been successful in reducing illiteracy toward its minimum, but in its arrangements for industrial education it is equally broad and systematic. The proportion of the population engaged in mechanics and manufactures is less than in Rhode Island, but there is no place of any considerable size, wanting in some sort of instruction having in view the various industries.

"Improvement" schools, "Real" schools, "Trade" schools, "Weaver's" schools, and special schools of many

kinds, are found thickly, scattered over the entire country, affording facilities not only for general but for special technical instruction that are unsurpassed. In the lower order of these institutions, there is a similarity to our elementary schools, with the distinction that, *invariably*, the strictest attention is given to instruction in *drawing*. Of the secondary schools, we give the curriculum of one of the best, styled the "City-trade School of Berlin." It was founded "to give a more appropriate education for the mechanic arts and higher trades, than can be had through the courses of the other schools," and has the city of Berlin as its patron. The subjects of instruction are Religion, German, French, English, Arithmetic, Algebra, Geometry, Geography, History, Natural History, Physics, Chemistry, Technology, Writing, Drawing and Vocal Music.

The school is provided amply with laboratories, apparatus, and all the paraphernalia of instruction, and technology is taught by describing and illustrating the different arts and trades by models and visits to workshops of which there are none connected with the institution. Pupils enter after they are twelve years of age, and remain five years to complete the course. Higher than this in order and forming the summit in the grade of industrial schools, is the Royal Trade Academy at Berlin, which embraces in its course, far more advanced mathematical studies, and has extensive workshops connected with it, where various branches of practical mechanics are taught. The pupil begins with the making of a screw, and proceeds in regular order to the most difficult mechanical operations.

An Industrial Drawing School in Berlin, also, trains designers of patterns for printing silk, woolen and cotton tissues, and paper hangings, together with all the theoretical and practical branches of weaving.

Among the large number whose organization we have noted, the Royal School of Machinery at Augsburg, in Bavaria, is interesting, devoting, as it does, more time to the practical side of mechanics. The requisites for admission are a thorough knowledge of Algebra and Geometry and a certain amount of practice in linear drawing. The pupils who must be fifteen years old pursue a theoretical course in higher Mathematics, Mechanics, Physics, Drawing, etc., but devote an average of three hours daily to the work shops.

The scholar is placed at a vise, and a coarse file and a piece of iron are given him. He practises first in filing planes at right angles, and then parallel to one another, then he does the same with a finer file. Nothing can be done superficially and no one can go on to other work until he has been thoroughly successful. Next, he is practised in boring, cutting screws, and in making faucets. Then comes the turning of round surfaces and of screws, smoothing off, etc., all of which is done with simple pieces of iron, out of which paper-weights, etc., are made. Other simple operations follow until the end of the course, when scholars are generally able to support themselves by work in any factory.

Enough examples have been furnished to show the general scope and variety of industrial schools in Germany,

and while from the hundreds of them in operation, covering very many special trades and occupations, we might select some of unusual interest, we have not space for the details in this report.

In Austria, the agencies for the education of skilled labor are of various kinds and increasing in number. They have as in Germany, the "improvement" and the ordinary technical schools, but the great impulse which the art-industrial movement has received during the last twenty-five years, has called into existence new establishments of a similar nature, but largely devoted to special trades and industries.

These comprise theoretical schools and school shops, in which the practical and theoretical teachings are combined. The number of these schools has increased, in the last five years, from *ten* to *one hundred and thirty*. In the highest of the industrial schools, nearly one-third of the time is devoted to free-hand and geometrical drawing.

FRANCE.

France is equally aroused with her continental neighbors to exertions for increased facilities for industrial-art education, and has rapidly augmented the number of schools for the elementary training of the young in this respect. While perhaps, failing to equal Germany in the universality of the system, she compares quite favorably in certain localities, and in the higher class of technical schools.

In 1802, when Napoleon was First Consul, he visited one of the government institutions and was extremely dissatis

fied with the answers of the pupils about to graduate, as to their intentions for the future. These, he said, unless they entered the army, would become "a burden rather than an aid to their families." He had observed workmen in the manufacturing establishments, who were experts in the manual labor of their trades but deficient in the theoretical part, and hence he determined to change the course at this institution, so that it should be devoted to "the study of trades, with so much theory as is necessary to their progress." This was done by an order soon after published, and the result has been one of the most successful institutions in the world for this purpose, at Chalons.

The plan has been modified during the last few years, so that instead of teaching a number of trades, it is devoted to general mechanical industries for which theoretical knowledge is indispensable. The shops connected with it, are the Pattern shop, Smithy, Foundry and Fitting shop. The pupils, who must be fifteen years of age, devote five hours or more daily, to the work shops, in which the general plan of instruction and practice is very similar to that previously described, at Augsburg.

The general principles are, to make only one piece of the same kind, and to do all work, as far as practicable, by hand, and with the simplest tools. The school curriculum embraces Mathematics, Drawing and the elementary branches.

Paris has numerous industrial schools of every grade, and throughout the country are found local institutions,

often under the patronage of industrial societies, or established by individuals from philanthropic motives.

Notwithstanding all that had been done previously, a government report after the exhibition of 1867, states that "additional efforts must be put forth to maintain French industry at the level which it has reached, and enable it to meet the rivalry of other countries in fields, once by universal confession, exclusively their own."

The result has been, as in other countries, a period of remarkable activity in this direction during the last ten years, the beneficial results of which were seen in the display of industrial products at our Centennial, and will be far more evident at the next exhibition in 1878, on their own soil.

It would be a pleasing labor, if our time and space allowed, to note in detail the progress of other countries of Europe and to give comparative views of their advance in industrial art education.

England, Holland, Italy, Sweden, Russia and the other countries have been actively working, and in each of them we find much to interest and instruct, but enough has been written to demonstrate the fact that in all of them, the problem of industrial education is considered of vital importance, and that in its solution they are many years in advance of our own country.

OUR OWN COUNTRY.

We have had in this country a few technical schools of a high order, whose pupils were instructed in the theory

but not in practice, unless we except the chemical laboratory work. A prominent educator, connected with one of the best of them, remarked not long since; "Our graduates go out into the world with their brains well-stocked with theories, but *with their hands tied behind them.*"

In occasional instances, institutions have been established where theory and practice were conjoined, as in the Worcester school, and the "Illinois Industrial College," with good results. The latter institution was established by the State of Illinois, in carrying out the intention of the act of Congress in 1862, giving grants of the public lands and prescribing, in return, the promotion of the "liberal and practical education of the industrial classes in the several pursuits and professions in life," as conditions, accompanying acceptance. The State of Illinois has added liberally to the original fund, and the university now has property valued at nearly a million dollars, including a system of mechanical workshops and other paraphernalia for a complete industrial training.

In the State of Massachusetts much attention has been given to the subject, and throughout the State drawing has been taught in the public schools, being correctly deemed the true foundation of industrial art.

In Philadelphia, an association of private gentlemen organized the Pennsylvania Museum of Art, early in 1876, and took advantage of opportunities offered at the Centennial Exhibition to secure a large collection of

industrial masterpieces, to form the foundation of the museum, which like its prototype, the South Kensington Museum, in England, which within twenty years has revolutionized many branches of industry and created new ones, is expected to become an important aid to industrial education and culture. The State of Pennsylvania is moving in this matter, and recently at the Governor's request, Prof. Smith of Boston, made an address to the legislature of that State, which made such a favorable impression upon the members, as to leave little doubt of a speedy legislative enactment making Drawing an obligatory branch in the public schools of that State.

In New York city, the schools of industrial-art, organized through the munificence of private individuals and associations, have for some years past been doing a noble work, especially for young women, hundreds of whom, have been enabled by the instruction there obtained, to secure remunerative and congenial employment, adapted to their sex. There are various institutions in other states as well as individual organizations prompted by philanthropic motives, which have accomplished a good work, but, for the people as a whole, it must be admitted, we have done very little. Probably, our wonderful progress in inventions, and our ability to draw from Europe, by the popularity of our democratic institutions, and a higher rate of wages, constant supplies of skilled workmen, have induced our past apathy, but the vital importance of immediate action is now generally recognized.

In his paper, read before the Boston Society of Arts, on the "Social and Political Economy of Universal Industrial Education," Dr. Bartol says : "Industrial education of the whole people would make the whole people honest. It would detect the mechanical or artistic genius, which now is left to be discovered by an accident, or to be buried in a studiously neglected nature, as in a living grave. Often in the circle of my acquaintance, some gift for artistic hand-work has struggled forth ; had it been searched for and tempted forth by the expert educator at an early stage, it would have won the prize it now lags behind. Industrial education can do more to ameliorate woman's lot and man's than the ballot, an external implement which wielded intelligently, is a blessing, ignorantly, a curse to the land."

Sentiments like these, emanating from a man of such marked culture and mental ability, fitted by his training and long experience in matters affecting the public welfare to give a sound opinion, are a sure indication that the subject of the education of the hand is worthy of general consideration, both as a question of morals and of political economy. While many persons of the highest intellectual resources, are endeavoring by thought, study and speech to aid in obtaining a satisfactory solution of the question, others, in a quiet way, are striving to work it out by experiment. One instance of this has come to our knowledge and in reply to a request for specific information, we have received the following letter, which is extremely interesting in furnishing the details of a simple experiment, which has

so far, proved to be so practical and successful as to deserve imitation. We quote the letter as follows :—

BOSTON, FEB. 1877.

DEAR SIR :

Our "*whittling school*" has opened its jack-knife every winter for five years. Thirty or forty boys from twelve to sixteen years of age have belonged to it, and with the aid of jig-saws, a turning lathe and a few simple tools, they have made brackets, match-boxes, small chests checker boards, and such trifling things. We have accommodated the school in our chapel, and found no difficulty in accomplishing the little thus described, with portable work-benches, etc. The value of such a school, is not in the amount of skill the boys attain to, but in the bent it gives their taste, and in the innocent enjoyment it gives to their leisure hours. The boys say they do six times as much work at home as they do at the school.

This year, our school is on a different basis. The city has given us the use of one of its ward-rooms on Church street, and we have put up excellent work-benches, with a vise to each, a box or drawer, and three chisels to each boy. We have planned a course of twenty four lessons in wood carving, and begun with thirty-two boys. The lessons are graded and pursue a natural and progressive course, just as writing is taught in our public schools, beginning with straight lines and going on to curves. I wish you would go down to the Church, Street ward-room any Tuesday or Friday evening, from 7 to 9 o'clock, and see the school. To my eye, it is the finest sight in Boston. It shows what can be done for hand-culture, and how easily it can be done. Mr. Frank Rowell of Allen & Rowell, Photographers, is at the head of the school. He has been the superintendent of our whittling school from the first. He has two practical wood carvers under him, at \$7.50 an evening. We who care for the work, have formed a society called the "Industrial Educational Association" and we meet every other Tuesday evening, in Hollis street Chapel.

We devote ourselves, for the present, to this one school, hoping to

make it a demonstration to the School Board, that Hand-Schools can be systematized and conducted by them, if they will do it. Please accept this as an answer to your inquiry, and use it as you like."

Sincerely yours,

GEO. L. CHENEY.

Other individual enterprises in various parts of the country have come to our knowledge, interesting in their details and successful as to results, but enough has been given to show that the people of this country are aroused to the importance of this branch of a complete education, and are eagerly looking for something that may offer to the rising generation, in connection with the culture of the intellect, a corresponding training for the hands.

The teaching of specific trades has often been urged, but the objections are so numerous, and the experience of the past so decidedly in opposition to such a plan, that aside from the difficulties arising from the option as to the particular trades to be taught, the expense of any general system would condemn it.

What is desired, is some system that will teach *the arts which underlie many industrial occupations*; something that will educate the hands and eyes; something that will furnish such a course of manual training, as will enable our children, when they complete their course in the public schools, to secure some kind of employment, and not feel that they are incompetent to live, except "*by their wits.*"

If we can secure this, without limiting or abridging the usefulness of the system of education we now have in operation with such great success, we shall succeed in achieving

for our day and generation and posterity, a blessing comparable in value with that which the founders of free public schools handed down to us.

In a careful study of very many systems of industrial instruction in Europe, we have found that all agree in one respect, namely, that *Drawing is an indispensable basis*. From the primary grades to the highest institutions of technology, Drawing is invariably a prominent feature of the curriculum. In all of these schools, the same general principles are followed in uniting manual and mental instruction and in familiarizing scholars with the use of tools. The details of instruction, in the scores of schools we have studied, have differed more or less, but in nearly all of them the plan of manual instruction, involved the methods of the apprentice system. In the school at Chalons, and also in that at Augsburg, there is an advance upon the old methods, but in Russia, at the Imperial Technical School, at Moscow, they have taken an entirely "new departure" in manual education, by conforming it strictly to the system and well established principles which have proved successful in developing skill in other arts and sciences. By this system, they *analyze the processes requiring manual skill, and teach each process by itself to a class*.

The first principles are taught and exercises in practice accompany them, leading the pupil on from the simplest to the most difficult manipulations. Just as in teaching one to play upon the piano, the "scales" and simple exercises come first and receive entire attention, rather than set tunes, which are tried only after months of preliminary practice; or, as

in Drawing, the pupil first practises upon straight lines and their various combinations, and then after long exercise, attempts anything requiring skill; or, as in penmanship, the first efforts are upon lines, curves and parts of letters, before writing words; so, in manual instruction at this institution, the systematic progress of the pupil, is the paramount consideration.

The collection of implements and pieces of machinery contributed by the Russian government to illustrate the work done at that school, formed an interesting exhibit in Machinery Hall, at our Centennial Exhibition, and furnished to interested observers, a definite idea of the plan, system and results obtainable from it.

Among those whose attention was specially attracted by it was President Runkle, of the Massachusetts Institute of Technology, whose skill as an educator and penetration as a man of science, enabled him at once to discern the novelty and special merits of the system and its adaptability for use, as an adjunct to his own institution, the need of which, he had keenly felt for a long time. He mastered the details of the plan and upon returning to Boston, so favorably impressed the Mass. Charitable Mechanics Association and private individuals interested in industrial education, that in a short time they placed enough money at his disposal to enter upon the experiment. Inexpensive shops were built and fully equipped, in the different rooms, with all the appliances for vise-work, forging, planing, turning, drilling and iron-founding.

In response to the polite invitation of President Runkle,

who had been informed of the inquiry of this Assembly in regard to industrial education, we spent a day with him, for the purpose of receiving a full explanation of the plan, and of having ocular demonstration of the results thus far achieved. The pupils, since the commencement of the lessons, had completed the course in "filing," and we saw, in the results of only *eighty hours* of practice and instruction, such exquisite workmanship as could not be surpassed by an apprentice of two years' experience in an ordinary shop. We found a class of thirty-two boys, at work on a "chipping" exercise, with hammer and chisel, under the instruction and constant supervision of an expert mechanic, employed as teacher of practical mechanics, and it was easy to perceive that the class instruction in this branch of education, was as systematic and simple as the teaching of a class in Arithmetic or Grammar in one of our best public schools. Our attention was directed to the fact, that these shops are for *instruction* and not for *construction*. The object of the labor performed is not to produce salable articles, but to impart mechanical skill, and hence, the student can here receive systematic instruction, proceeding from first principles to difficult manipulations, while in ordinary construction shops, an apprentice is taught only those things which accord with the convenience and profit of his employer. The fact, that the instruction is given to so many pupils at a time, in class, is a marked economical feature, carrying out, as in so many other respects, the analogy with our general system of mental training.

Our space forbids a full description of the many interesting details which came under our observation, as well as any account of the testimony already given by practical and expert mechanics, as well as by thoughtful and skilled educators, as to the wonderful results already secured in this experiment of an altogether novel method of industrial training, but we are fully satisfied, that enough has been shown, in the few months of trial, to warrant us in the opinion, that in this well-tried system, at once so simple and so economical, we can find a way to the solution of the great question of the *adaptation of industrial education to our existing system of mental training in the public schools.*

From the data and figures furnished us by President Runkle, based upon actual expenditures, we find that any school committee or city council can add an industrial department to their High School, erecting the necessary shops and completely furnishing them, at an outlay of from \$6,000 to \$8,000, according to the extent of appliances, capable of giving instruction and practice to four hundred pupils per annum, at a cost not exceeding \$18.00 per scholar, and probably even less than that.

Everything necessary for the equipment of such shops, is made in our own state, and there is no doubt, that when our manufacturers are informed that it is proposed to teach *practical mechanics* in connection with our schools, they would vie with each other in furnishing the proper appliances, rejoicing in the prospect of relief from stupid and clumsy apprentices, and of securing, in their place, from the graduates of our public schools, boys with *cultured minds and*

skilled hands. From the large number of expert mechanics, now engaged in our shops, a suitable instructor could easily be found, as was the case in Boston, whose mental and mechanical qualifications would enable him, after a few days observation and study of the plan of instruction, to take charge of the classes.

As it is unlikely, that at first there would be enough boys in the High School to take all the time and room in the industrial annex, arrangements could be made to secure these great advantages to older boys in the Grammar Schools, to whom it would serve as an incentive to study. With such practical training in prospect, many a boy now withdrawn from the schools in order to find employment, would be continued in them, in order to secure such advantages as would better enable him to obtain more remunerative employment.

The High School would be popularized, and the benefits it now bestows so lavishly upon three per cent. of the school population, would soon be distributed to a larger proportion especially of boys, and that too, without any proportionate increase in the expense of their mental training. Those, who now fail to comprehend the advantage or necessity of the High School in our system, would soon be able to recognize it, as the crowning glory of our series of schools, dispensing to rich and poor alike, the blessings arising from such a harmonious blending of mental and manual culture, and rendering back to the community, in skilled hands and intelligent minds an ample return for all its expenditures.

The importance of some suggestion in this report, having special reference to the industrial training of girls is not forgotten, and has been the subject of careful consideration, but we have not reached any definite conclusion in the matter, excepting that in respect to *Drawing* in the schools, which of course, would apply to, and equally benefit both sexes. Individual efforts, notably in connection with the Cooper Institute of New York, have resulted in great benefit to young women, in preparing them in the Schools of Design, for a more extended sphere of labor, than has heretofore been open to them, and there is now pending in this House, an application for an Act of Incorporation of a School of Design in this State, which is an auspicious indication of the deep interest, our own people are beginning to take in these important matters. Hence, with the knowledge, that so many of the best minds are now searching for whatever plan may seem practicable for the industrial education of girls, we must, in omitting further consideration of this part of our subject, content ourselves with the consciousness, that all of the great advantages now offered in our schools, are common to both sexes, and will be in future, so far as may be consistent with the physical constitution of each.

In response to the resolution of inquiry referred to us, and in the light of the considerations heretofore submitted in this report, we beg to present the following specific suggestions as a plan for the "instruction of the pupils attending the public schools in the industrial arts," viz:—

1st *Instruction in Drawing in all of the schools.*

2d Instruction in the Mechanic arts, in work-shops, as a co-ordinate branch with the mental training in the higher grades.

In harmony with these suggestions, the practicability of which, we have endeavored to demonstrate, we submit herewith, the form of an act to accomplish the first, and a resolution in regard to the second, recommending the passage of both by this House, if in the wisdom of its members it should seem expedient.

The act is as follows :—

An Act to supply a foundation for Industrial Education in the Public Schools.

Be it enacted by the General Assembly as follows:

Section 1. In all towns of the state having a population of more than 5000 persons, provision shall be made for instruction in Drawing in the Public Schools.

Section 2. This act shall take effect on and after Sept. 1st, 1877.

The Resolution is as follows :—

Whereas, the experience of nations has proved that superiority in the mechanical and manufacturing industries can only be maintained by the most assiduous care in the industrial training of the young and,

Whereas, we believe that there is a deficiency in such training, in the State of Rhode Island, which must, sooner or later, unless remedied, result disastrously to the most important interests of the State, therefore,

Resolved, That this General Assembly (the Senate concurring) recommends to the attention of the people of the

towns of the State, the importance of as speedy action as may be practicable, to promote the introduction of the best methods to insure a thorough *manual* education, as a supplement to the instruction now given in the Public Schools.

In a state so absolutely dependent upon its mechanical and manufacturing industries, as Rhode Island unquestionably is, it certainly is the most important and practical question of the day, how the permanent prosperity of those industries can best be promoted, for upon them depend very largely, the comfort and happiness of a large proportion of our people.

Experience teaches us that this can only be accomplished, by such an education of the masses as may develop manual skill and good taste in connection with their mental training. Common sense tells us, this should be effected by means of our public schools.

The increasing facilities for transportation and communication, are rapidly opening the markets of the whole world to the competition of nations, and in this great contest, if our country is to rank among the successful ones we must prepare at once by training our young to become masters of the arts of industry.

Our chief competitors are, in this respect, far in advance of us, and already have educated hosts of artisans, to take their part in this industrial contest.

In one great exigency in our nation's history, we produced an immense army of soldiers, almost extemporaneously; in a still more recent one, during the perilous period

of a closely contested and disputed presidential election, an extemporaneous outpouring of a spirit of peace and submission to law, saved us from threatened anarchy ; but in the industrial struggle of nations, no *extemporaneous efforts* will avail to help us, for, those who achieve the victory, must be artisans and mechanics, trained to the service by long experience, based upon the solid foundation of an adequate industrial training in early manhood.

Respectfully submitted for the Committee on Education.

HENRY H. FAY,
Chairman.

Providence, March 11th, 1877.







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